

(19)



Europäisches Patentamt

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(11)

**EP 0 923 877 A1**

(12)

## EUROPEAN PATENT APPLICATION

(43) Date of publication:  
**23.06.1999 Bulletin 1999/25**

(51) Int Cl.<sup>6</sup>: **A23K 1/00**

(21) Application number: **98500231.0**

(22) Date of filing: **22.10.1998**

(84) Designated Contracting States:  
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU  
MC NL PT SE**  
Designated Extension States:  
**AL LT LV MK RO SI**

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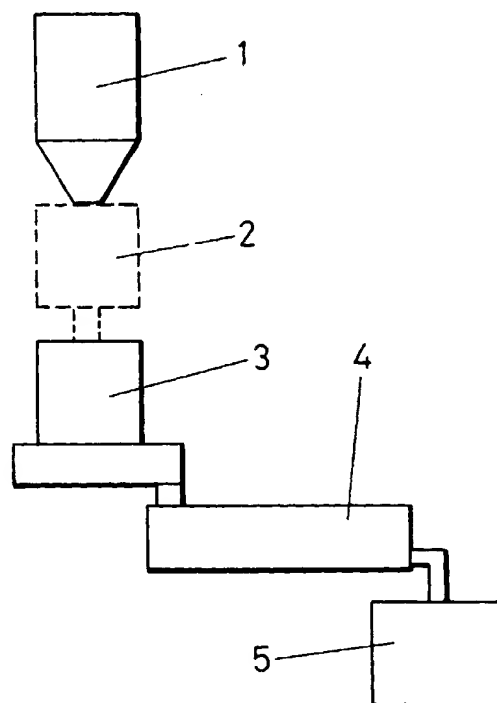
(30) Priority: **20.11.1997 ES 9702427**  
**20.11.1997 ES 9702428**

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(54) **Process for obtaining granulated carob or animal feed or raw material for feed obtained with such a process**

(57) Carob pulp obtained at the seed removal stage is used to start off with, which pulp is already ground although it may be newly ground and/or have water or steam added if the extent of grinding or humidity is not suitable, the pulp undergoing a pressure heating stage, within a pelletising press (3), granulator or the like, wherein the pulp is heated, loses part of its water content and takes its definitive granular shape, thereupon undergoing a cooling and drying stage (4) after which it is stored after being sacked (5) if that is deemed necessary. The grains obtained can comprise exclusively carob pulp or be mixed with additives and other raw materials for feed, in accordance with any set feed formula, taking the shape of small cylinders, prisms, balls or other geometric figures.



**FIG.1**

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**Description****OBJECT OF THE INVENTION**

[0001] The present invention relates to a process especially devised for obtaining a carob derivative which is useful as animal feed or as a feed component, in any granulated or pelletised conformation, to improve its handling conditions.

[0002] The invention also relates to the product obtained with such a process, which may be used directly as animal feed, or as a component for balancing a particular diet or formula.

[0003] The object of the invention is obtaining a product which, besides the organoleptic characteristics attached to such a feed component derived from its own components, provides substantial advantages from the standpoint of uniformity and handling.

**BACKGROUND OF THE INVENTION**

[0004] Carobs are known to have seeds which upon being eliminated leave a residue, a so-called "pulp" that is ground in the actual process for obtaining and separating the seeds, which pulp is useful in the field of animal feed as a feed balancer.

[0005] This carob pulp is usually included directly in animal feed, either with the extent of grinding obtained at the seed removal stage, or by subsequently grinding the same, which poses a problem due to its low density, which on the one hand directly affects carriage and storage costs and on the other poses functional problems in silos, consisting of clogging, vault formation, etc.

**DESCRIPTION OF THE INVENTION**

[0006] The above-described drawbacks are overcome by pelletising and granulating the product, i.e. the carob pulp, for this brings about a substantial density increase thereof which reduces its volume and prevents clogging in silos and the like.

[0007] More specifically and in order to achieve the above, once the pulp has been ensiled and optionally mixed with additives or other raw materials for feed, the process starts with a grinding stage with different intensity levels, which may indeed be non-existent, depending on the extent to which the pulp has initially been ground. Water or steam may be added to the pulp before or at the grinding stage in order to provide the pulp with a sufficient degree of humidity.

[0008] The product then undergoes a pressure heating stage, using for instance a pelletising press, a granulator or any other suitable pressure system to such end, at which operative stage the heating causes part of the water content in the pulp to be evaporated and moreover grains or pellets of any cylindrical, prismatic-quadrangular, prismatic-hexagonal, spherical, and other shape to be obtained.

[0009] The pelletised product then undergoes a cooling and drying stage and is finally sacked or stored.

[0010] The invention also relates to the product resulting from such a process which is useful, as aforesaid, directly as feed or a component included to balance any food formula, taking the shape of perfectly uniform small cylinders, prisms, balls or the like, their density being considerably greater than that of the simply ground product and hence results in a dramatic volume reduction which has a favourable impact on the storage and carriage costs, and in turn favours handling thereof, avoiding such problems as clogging in silos and hoppers, as aforesaid, yielding a uniform product with a lesser humidity degree, at the same time as the actual residual humidity is more uniform, which has a positive effect on a reduced risk of fungal proliferation.

**DESCRIPTION OF THE DRAWINGS**

[0011] In order to provide a fuller description and contribute to the complete understanding of the characteristics of this invention, in accordance with a preferred embodiment thereof, a single sheet of drawings is attached as an integral part of the specification which, while purely illustrative and not fully comprehensive, shows in its only figure a plant for working the process for obtaining granulated carob subject of the invention.

**PREFERRED EMBODIMENT OF THE INVENTION**

[0012] With reference to this figure, it follows that the carob, previously ground for removing its seeds, is housed within a silo (1) from which it passes duly metered to a mill (2) in which the grinding stage will take place to the desired extent, this being an optional stage, as aforesaid, because the extent to which the pulp arriving at the silo (1) is initially ground can be sufficient for the same to pass directly to the pelletising press (3) at which the heating and evaporation stage of part of the water content will take place, at the same time as the ground product is turned into a granulated, uniform product.

[0013] Similarly and depending on the degree of humidity, either before or at the actual mill (2), water or steam is added to the carob pulp, thereby contributing the required humidity to the carob pulp for the same to pass directly to said pelletising press (3).

[0014] Finally, the grains or pellets into which the ground carob pulp has been transformed are passed through a dryer (4) in which they are cooled and the water elimination process is completed, the product being duly conformed and dry, ready to pass to a sacker (5) or directly to the storage area thereof.

**Claims**

1. A process for obtaining granulated carob, charac-

terised in that the same starts with the ground carob pulp obtained at the previous seed removal stage, said pulp undergoing a pressure heating stage, preferably within a pelletising press, granulator or the like, wherein the pulp is heated at the same time as part of its water content evaporates, the granulated pulp then passing to a cooling and drying stage after which it is stored, optionally with a prior sacking stage.

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2. A process for obtaining granulated carob, as in claim 1, characterised in that the pulp optionally undergoes a grinding stage before the heating stage, which completes the previous grinding stage which takes place when the seeds are removed, and/or a water or steam contribution stage, before or at the actual grinding mill, which provides the pulp with a sufficient humidity before it passes to the pelletising press.

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3. A process for obtaining granulated carob, as in preceding claims, characterised in that additives and/or other raw materials for feed are added to the carob pulp in order to adjust the end result, from a nutritional standpoint, to any set formula.

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4. Animal feed or raw material for feed obtained with the process of the foregoing claims, characterised by taking a pelletised shape, i.e. being shaped as small cylinders, prisms, balls or other like uniform geometric figures, in which the carob pulp is duly compacted and desiccated to maintain a stable conformation and a considerably higher density than that of the initial raw material.

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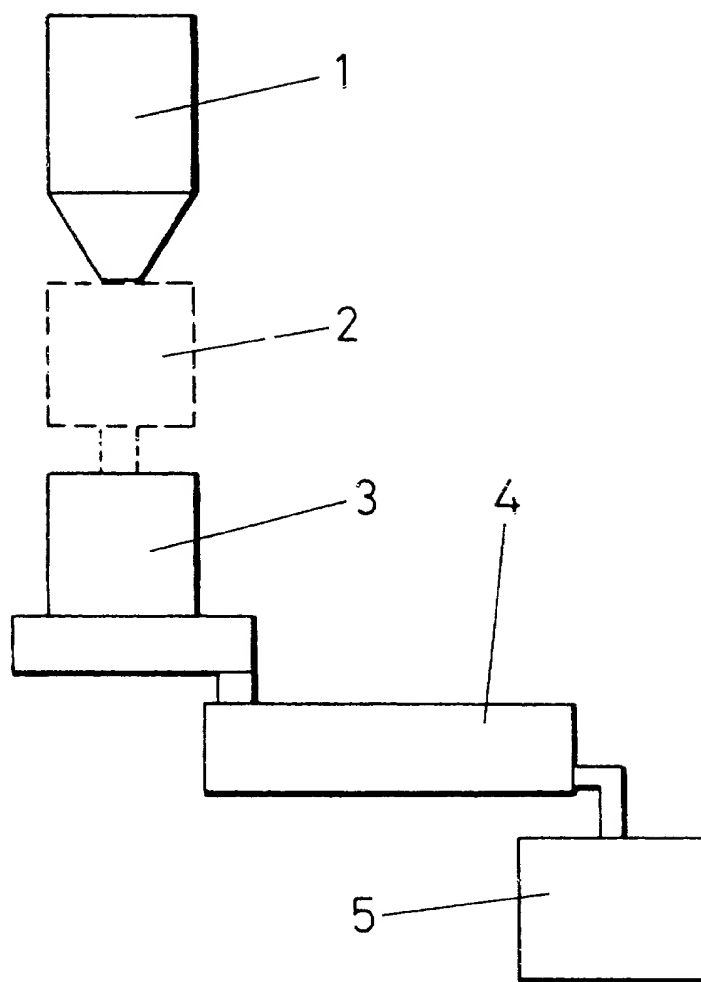


FIG.1



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## EUROPEAN SEARCH REPORT

Application Number  
EP 98 50 0231

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The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>18 February 1999</b>	Examiner <b>Dekeirel, M</b>
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document - : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 01/92 (F04C01)



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# EUROPEAN SEARCH REPORT

Application Number  
EP 98 50 0231

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Place of search		Date of completion of the search	Examiner
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<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone  Y : particularly relevant if combined with another document of the same category  A : technological background  O : non-written disclosure  P : intermediate document</p> <p>T : theory or principle underlying the invention  E : earlier patent document, but published on, or after the filing date  D : document cited in the application  L : document cited for other reasons  &amp; : member of the same patent family, corresponding document</p>			

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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